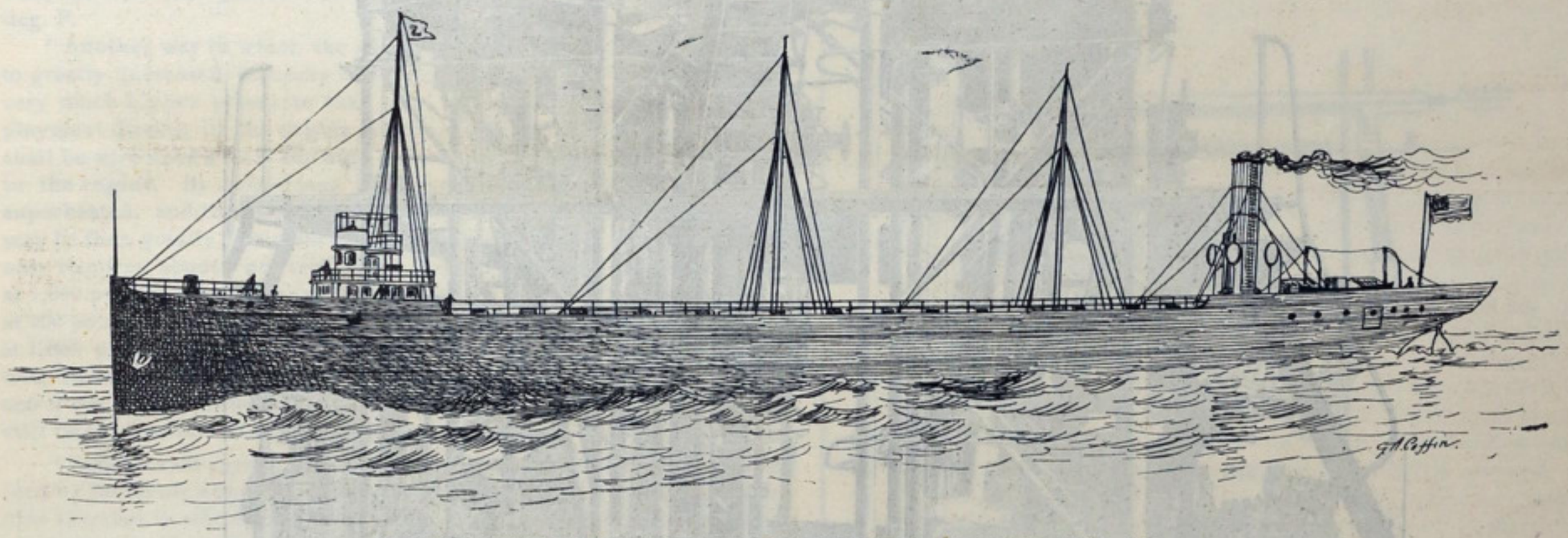
MARINE REVIEW.

VOL. XI. CLEVELAND, O., MARCH 28, 1895. No. 13.

The 400-foot Steamers.

A rough sketch of the steamer Zenith City, one of the two 400-foot freight carriers being built by the Chicago Ship Building Company at South Chicago is presented on this page. It is well known, of course, that this boat and the Victory, building at the same yard for the Interlake Company, a corporation made up largely of members of the firm of Pickands, Mather & Co, Cleveland, are to be practically duplicates, but little has been printed in the way of a description of either of them. The engraving was made to represent the Zenith City, which is to be owned by a syndicate formed by A. B. Wolvin of Duluth, and which will include such well known vessel owners as David and Frank L. Vance of Milwaukee, J. R. Irwin of Painesville, O., F. N. La Salle of Duluth, G. E. Tener of Pittsburg and John Green of Buffalo. This is the boat that is to be fitted with Babcock & Wilcox tubulous boilers, while the duplicate steamer is to have two Scotch boilers, 14 by 13 feet, allowed 170 pounds steam pressure.

The Zenith City will be 380 feet keel, about 400 feet over all, 48 feet beam and 28 feet hold.. She will have a water bottom of 54 inches. Her load from Lake Superior on present draft, 14½ feet, will be full 4,000 gross tons, and it is expected that with a 20-foot channel a year or more hence this will be increased in net tons to about 6,000. A feature of this boat and the Victory will be the big expanse of unbroken deck that they will present. Quarters for the crews as well as the dining room, steward's apartments, etc., will be located below deck. There will be no houses on deck excepting the Texas and pilot house forward. A turtle-back covering for quarters forward will extend only to the rail and the same will be true of the boiler house aft. Each boat will have eleven hatches, two of which will be located forward between the turtle-back and the pilot house. Machinery for both the Zenith City and the Victory will be the same as that now in the steamer Kearsarge, and it will all be built by the Cleveland Ship Building Company. The engines will be triple expansion, having cylinders 23, 38 and 62 inches by 40 inches stroke.



STEAMER ZENITH CITY—MODERN LAKE FREIGHTER—400 FEET OVER ALL.

Freight Rates Made on Ore and Coal.

Rather unexpectedly on Saturday last, the firm of M. A. Hanna & Co. of Cleveland took up with certain large vessel owners the question of making a lake freight rate on 350,000 tons of ore from the Oliver mine, Mesabi range, to be moved from Duluth to Ohio ports in the months of May, June, July, August and September of the coming season The ore was hurriedly taken at 75 cents by four managers of vessel property, two of whom were J. R. Irwin of Fairport, who controls the steamers Harper and Nimick and a steel consort building in Cleveland, and J. C. Gilchrist, who is the manager of one of the largest fleets of wooden boats on the lakes. The Oliver mine is owned by the Carnegies and Olivers of Pittsburg, and as this transaction was a freight arrangement made by furnace owners who were to consume their own ore, there was nothing to prevent it being made in advance of any regular sales of ore. It has set the pace, however, and although there are some vessel owners who have faith in the indications of an improvement in business conditions generally, and will not tie up to low rates, there is no denying the fact that a very large part of the Lake Superior ore output for 1895 might now be covered at 75 cents lake freight from the head of Lake Superior on contracts expiring with the close of September.

Vessel owners are not inclined to accept this rate on business for the full season, but it is not probable that they will, for the present at least, be offered anything better, as leading ore dealers, who are now concluding negotiations on big sales, announce that they will offer only 75 cents on freight contracts running to Nov. 1. It is quite probable that heavy sales of ore will be made before the close of the present week on the basis of the new range of prices upon which the ore dealers have agreed, and which represent an increase of 15 to 20 cents a ton over last year's prices. In fact, it was definitely stated Thursday that one of the desirable low-phosphorus standard Gogebic ores had been sold at the price fixed for it in the agreement. Extensive sales are quite certain to follow this transaction, and the developments of the coming week will tend to show whether vessel owners are generally determined to refuse contracts at less than 80 cents from ports at the head of the lakes.

About 100,000 tons of Pewabic mine ore, which is also controlled in part by the Carnegie company and which has been carried in past years by the steamers of the Milwaukee Tug Boat Line, has been covered, to be moved from Escanaba, at a rate said to be a trifle less than 55 cents. The rate is certainly not more than 55 cents. This is also a transaction with consumers and is also made in advance of any regular sales of ore from mines of the old ranges shipping through Escanaba. These contracts are, however, enough to indicate what may be expected when sales are more extensive a few days hence. The nine steel steamers of the Menominee and Mutual transportation companies, some of which were engaged last season in carrying from Duluth the Oliver ore referred to above, will all trade to Escanaba during the coming season, as the firm of M. A. Hanna & Co. expects to provide business enough for them in moving the output of the Chapin and other mines which they operate on the old ranges. A small block of ore to be moved from Escanaba to a Buffalo furnace has also been covered, but the rate has not been made public, and anyhow the transaction is not of special importance, as the draft of vessels engaged in this trade must be limited.

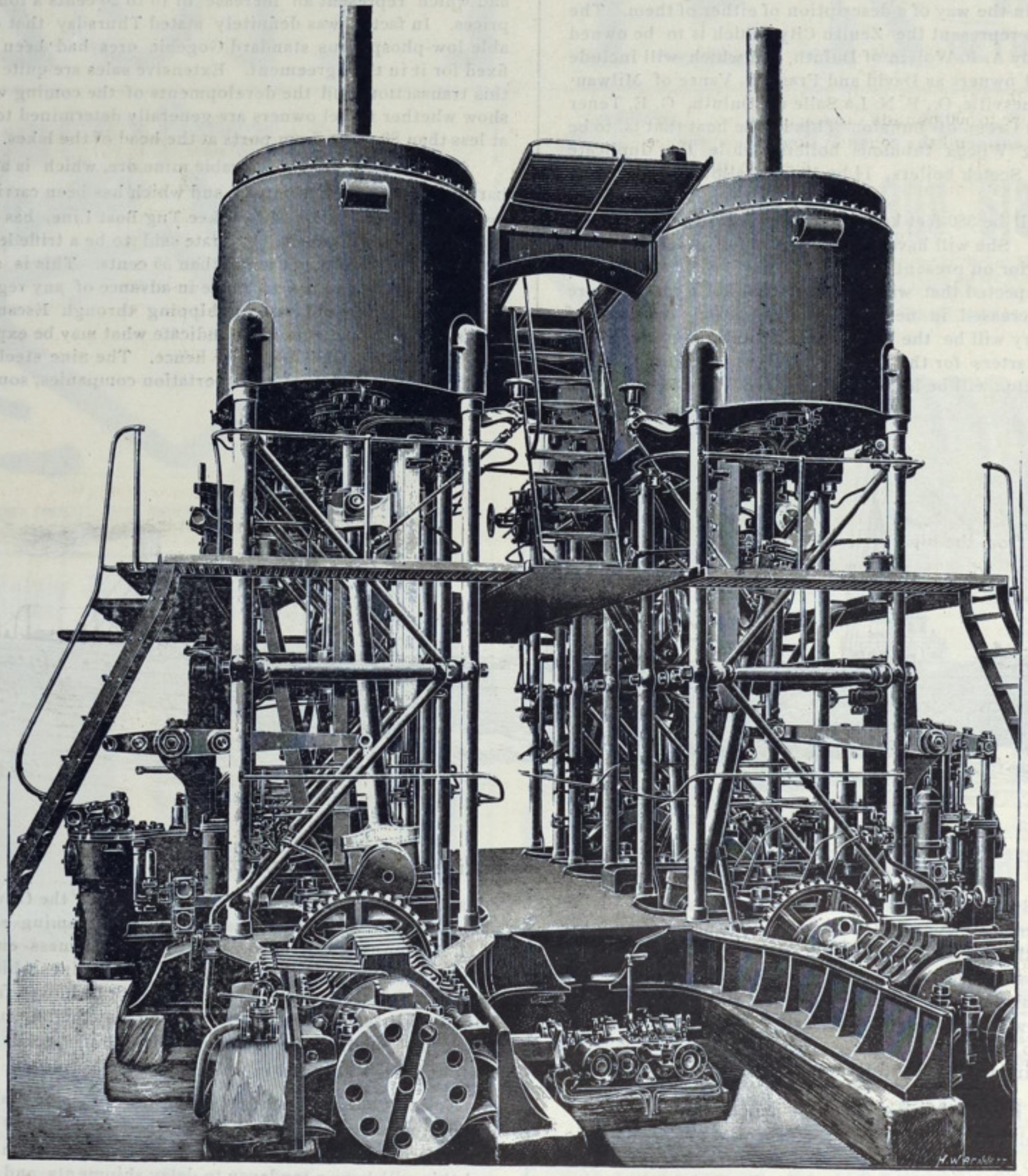
Nothing has been done as yet in Lake superior coal rates. It is quite generally understood that there will be about 250,000 tons of coal, hard and soft, on dock at the head of Lake Superior when navigation opens, and this will have a tendency to delay shipments and cause some coal to be carried to Lake Superior at very low rates during the early part of the season. Coal companies represented by Francis Robbins of Pittsburg have secured the sale of Milwaukee gas coal at a very low figure and are trying to get vessels to take it from Fairport to Milwaukee at about 40 cents. Two lots of about 100,000 tons of hard coal and less than half that amount of soft coal to be moved from Erie and Toledo, respectively, to Sheboygan, Wis., have also been on the market during the past few days. W. L. Scott & Co. of Erie had the hard coal and the Sunday Creek Company the soft coal. The Sheboygan docks furnish good despatch, and there was, accordingly, considerable figuring for this business. There is no report of it having been closed, but there was reason to expect that the struggle for it would result in the rate being forced down to about 40 cents. A few single trip charters for soft coal to Portage have been made at 40 cents, and on several million feet of lumber to be moved from Escanaba and other Green bay ports to Tonawanda the very low rate of $1.50 has been made.

Engines of North German Lloyd Australian Liners.

The triple expansion engines illustrated on this page are those of the North German Lloyd steamers Prinz Regent Luitpold and Prinz Heinrich, now in service between Bremen, Southampton, Genoa and Australian ports. The engraving is from Engineering of London. The vessels and machinery were built by F. Schichau, ship builder and engineer of Elbing. These engines develop 6,000 horse power at 88 revolutions, and are of a type constructed by the same concern for Danish war ships. They are so constructed as to be easy of access on all sides, so that a small staff of engineers can see to everything required. The principal dimensions of the two mail steamers to which they are fitted are as follows: Length on water line, 450 feet; beam, 50 feet; depth amidships, 32 feet 10 inches; height of decks in cargo spaces, 7 feet 9 inches; height of passenger deck, 8 feet; gross register tonnage, 6,100; displacement, 11,750 tons. A large deck house amidships has accommodation for seventy-five saloon passengers, as well as officers and engineers; seventy-six second-class passengers are accommodated in the poop, while on the upper deck there are berths for 960 steerage passengers. Sailors' quarters are in the forecastle.

The twin engines have a central platform for the engineer in charge. The two large surface condensers and the auxiliary machinery are in the wings, and are within easy reach. The boiler room is fitted with four cylindrical boilers, two of which are single-ended in the after end, and two double-ended in the forward end of the boiler compartment. The boiler and engine compartments are separated by a coal bunker athwartship, with a narrow tunnel passage. There is another athwartship bunker forward, and both reach up to the main deck, coal also being carried on either side of the boiler uptakes to the upper deck. Twelve hundred tons of coal can thus be stored in these bunkers. The donkey boiler is on the main deck, close to the main boiler uptake. Both the engines are of the triple expansion type, with surface condensers, and they work with steam of 175 pounds. The cylinders are 28.3 inches, 46 inches and 70.8 inches diameter and the stroke 47 inches. The high pressure cylinder is provided with a piston valve, the two others each with a slide. The valve gear is actuated by eccentric and link motion and a steam starting and reversing engine. The surface condensers are cylindrical, and have an area of 7,190 square feet, being of galvanized iron. The air pumps are fixed to the back of the engines, and are worked by beams from the cross-head of the low pressure cylinder. Circulation is maintained by centrifugal pumps, each driven by a special compound engine. These centrifugal pumps can also draw from the bilge by the interposition of an automatic valve. The feed, bilge, and sanitary pumps are close by. The crank, thrust, and propeller shaft, as well as the tunnel shafts, are made of the best soft German steel, the total length of one set of shafting amounting to 170 feet. The crank shafts have all the same dimensions and are interchangeable. The propeller shafts, of 50 feet 10 inches length, rest in cast-steel bearings. The propeller itself has a diameter of 15 feet, and three blades of bronze fixed in cast-steel hubs.

The two double-ended boilers are each 17 feet 9 inches long by 16 feet diameter, and the single-ended boilers are 9 feet 1 inch long by 16 feet diameter. The total heating surface is 16,512 square feet and the grate area 378 square feet. One of these vessels made on trial a speed of 15.5 knots, the displacement being about 9,000 tons, steam pressure 175 pounds, revolutions 87.8 and vacuum 0.92 atm. The collective indicative horse power was 5,606.



TWIN-SCREW TRIPLE EXPANSION ENGINES OF NORTH GERMAN LLOYD AUSTRALIAN LINERS.

Advantages of Water Tube Boilers.

At a meeting of the Institute of Marine Engineers and Ship Builders, held in Scotland, a few weeks ago, Professor W. H. Watkinson, an eminent English authority in marine engineering matters, read a paper on water tube boilers, which has been widely reprinted, on account of the clear way in which it deals with advantages of the tubulous type of boiler and the causes that are now bringing it into great favor.

"The two chief reasons for the present great reaction in favor of water tube boilers," the writer says, "appear to be the greater ease and safety with which high pressures can be carried in boilers of this type than in boilers of the tank tye, and the considerable reduction which may be made in the weight of the boiler as well as in the weight of water in the boiler. In the past every notable increase of steam pressure under proper conditions has led to a considerable decrease in the water and coal consumed per I. H. P. hour. With increase in pressure from 80 pounds to about 160 pounds the consumption of coal has been decreased by about 25 per cent. per I. H. P. hour. The theoretical saving, as deduced from the increased range of temperature, amounts in this case to about 27 per cent. Assuming that the actual gain continues to practically agree with the the theoretical gain, it may be easily shown that by increasing the pressure to 500 pounds the efficiency would be still further increased by 38 per cent., and the consumption of coal reduced to a little less than 1 pound per I. H. P. hour. With multi-cylinder engines there should be no very great difficulty in working with this high pressure, seeing that in the case of locomotives, pressures of 160 pounds and upwards are advantageously used, in one cylinder, and that in the case of gas engines pressures of over 300 pounds are used, the whole of the expansion being effected in one cylinder. In the latter case it should also be remembered that the cylinder is filled with a white hot flame during each working stroke, and as there is no special difficulty in connection with the lubrication, owing to the adoption of dense mineral oil as the lubricant, there surely should be none in connection with steam at the comparatively low pressure of 500 pounds per square inch, viz., 467.4 deg. F.

"Another way in which the adoption of water tube boilers may lead to greatly increased economy is by enabling steam to be generated at very much higher pressures than may be possible or convenient of employment directly in the engine cylinder, and arranging that the steam shall be wire-drawn from the high boiler pressure to that suitable for use in the engine. By this means the steam will be safely and efficiently superheated, and the losses from liquefaction of steam in the cylinders may be then greatly diminished, or altogether obviated. For example, it only requires about 5 per cent. more heat to generate 1 pound of steam at 1,000 pounds pressure than is necessary to generate 1 pound of steam at 200 pounds pressure, the feed water being at 200 deg. F. If this steam, at 1,000 pounds pressure be then wire-drawn to 200 pounds pressure, it will, assuming the steam to be initially dry, be superheated 105 deg. F., and if the steam initially contains 3 per cent. of priming water, it will still be superheated 49 deg. F. by the above amount of wire drawing.

"Experiments recently made in France and in Germany, and in England by Professor Kennedy and Mr. Bryan Donkin, show that a considerable increase in efficiency may be obtained by superheating. Some time ago Professor Kennedy tested a simple expansive engine in which steam pressures of from 9½ to 15 atmospheres were used, the steam being superheated by more than 200 deg. F., its temperature being then at 600 deg. F. No difficulty whatever was found in connection with the lubrication, even at this high temperature. He also reports having examined an engine which had been at work under these conditions every day during a year and a half. The valve and piston were found to be in splendid condition, as neither of them passed any steam even at a pressure up to 13 atmospheres. He found that the inside of the cylinders had a smooth, glassy, and quite greasy surface. 'Its condition, in fact, conld not have been better under any circumstances.' Mr. Bryan Donkin's experiments showed an increase of efficiency, due to superheating, by only 50 deg. F. of from 15 per cent. to 27 per cent. according to the cut-off. For pressures of 150 or 200 pounds, a superheater of the ordinary type, with steam on one side and furnace gasses on the other side of the heating surface, would be most dangerous, but superheating by wire-drawing, as indicated above, would be perfectly safe. This method of superheating also gets rid of one of the greatest difficulties which has been encountered in connection with superheating in the ordinary way, viz., the regulation of the amount by which the steam is superheated. In the case of engines for electric light stations, for example, fitted with automatic variable expansion gear, the steam supplied by the boilers would be drier when working at light loads, and therefore the snperheating would be greater, which is precisely the condition necessary for maximum economy.

"The adoption of boilers of the water tube type also renders it possible to generate steam from water which has been highly superheated under great pressure by mere reduction of pressure. For example, if water is raised to the temperature corresponding to that of steam at 1,000 pounds pressure, and its pressure be then reduced to 200 pounds pressure, one-fifth pound of steam at this pressure will be generated from each pound of water thus treated. The possible advantages of this method, in which nothing but continuous water is in contact with the heating surfaces, are rendered obvious by the following facts. When boilers are greatly forced, a very considerable proportion of the heating surface is covered with steam bubbles instead of with continuous water, and unless the circulation is sufficiently rapid the heating surface becomes liable to serious overheating, and if the boilers are forced beyond a certain limit the heating surfaces may be burned out. The author found by experiment that if water ceased to flow continuously through a tube, it is impossible to injure the tube by the fiercest oxy-gas flame which he could command; whereas when steam only passed through the tube, the tube was melted in a few seconds. In this connection Mr. Thornycroft says: 'To obtain the highest evaporative duty from a given tube surface it is necessary that the contents of the tube should consist of as far as possible, water only.' If this method of heating water under high pressure be continued until the 'critical condition' is just passed, instead of only a proportion of the water being converted into steam when the pressure is reduced,

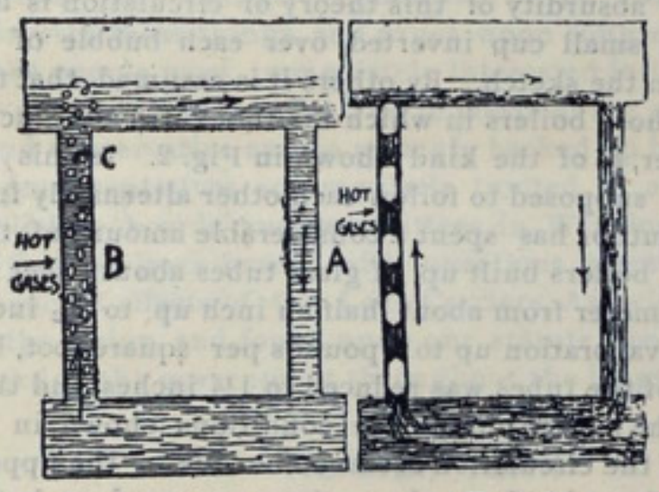


FIG. 1. FIG. 2

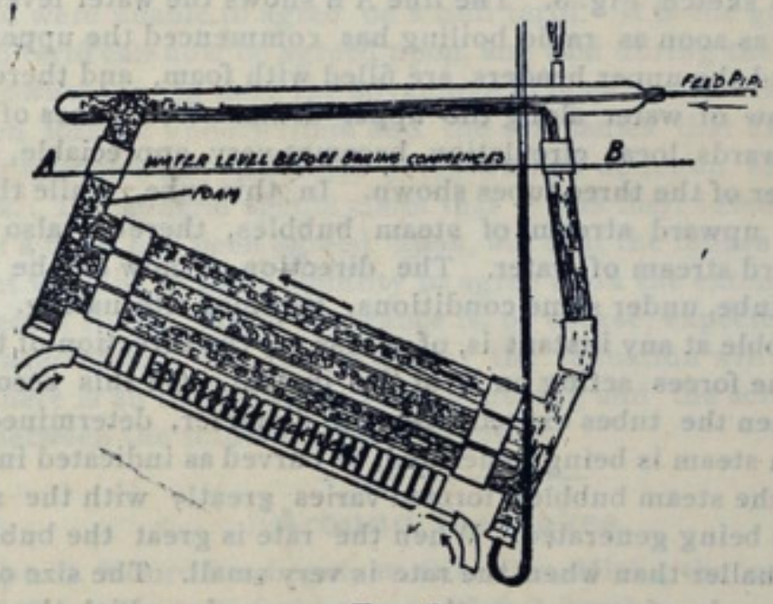


FIG. 3.

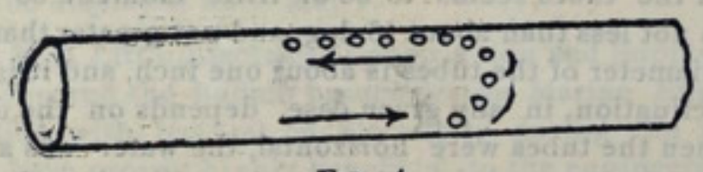


FIG. 4.

the whole of it will be converted into steam which will superheat as it expands. This critical condition is reached with water when the temperature is approximately 698 deg. F. and the pressure a little below 3,000 pounds per square inch (195 5 atmosphere.) This pressure, although great, can be more safely carried in the boilers of the water tube type than pressures of 150 pounds in boilers of the tank type.

"Circulation.—This is a branch of the subject which has been very much discussed, but about which very various opinions prevail. Some even go so far as to say that rapid circulation is not necessary, but only harmful on account of its being the main cause of priming. In the case of most types of water tube boilers, however, rapid circulation is absolutely necessary, as by means of it the temperature of the boiler is approximately the same in every part, and if this were not the case, leakage at the joints would inevitably result. Other advantages of rapid circulation throughout the tubes exposed to the furnace gases are—the prevention, more or less absolute, of deposits of salts and grease in the tubes. In some cases, with types of larger diameter, in which a large amount of local circulation must have taken place, it has been found that the tubes were burned out in consequence of the deposit of grease within them; no such burning takes place when the tubes are of smaller diameter and the circulation is less local and more vigorous. Rapid circulation also causes the films of air to be swept from the heating surface and carried

up with the steam into the upper drum. When the air is not thus got rid of it causes rapid oxidation of the interior of the tubes. The causes of circulation are: First, difference in density of the water due to difference in temperature when the fires are first lighted. This circulation is very sluggish. Second, when the water is all at the same temperature and steam is being generated, but not with sufficient rapidity to cause a break in the continuity of the water, a comparatively sluggish circulation is set up by the entraining action of the bubbles of steam rising through the water. Third, when steam is generated with such rapidity that in some part of the circuit there is foam only present, a very rapid circulation takes place due to the difference in density between this foam and the continuous water in the down comers, internal or external. These conditions are illustrated in the accompanying diagrams. It is sometimes maintained that as the average density of the substance in the tube B, Fig. 1, is less than that of the substance in tube A, a circulation must take place in virtue of this. This is quite incorrect, as the hydrostatic pressure at the bottom of tube B must be just equal to that at the bottom of tube A, so long as the continuity of the water is not broken in either of them. The absurdity of this theory of circulation is at once seen, if we imagine a small cup inverted over each bubble of steam, as indicated at C, in the sketch. By others it is assumed that the circulation especially in those boilers in which the tubes are not much greater than 1 inch diameter, is of the kind shown in Fig. 2. In this case the water and steam are supposed to follow each other alternately in plugs as indicated. The author has spent a considerable amount of time in experimenting with boilers built up of glass tubes about 2 feet in length, and varying in diameter from about half an inch up to 1½ inches, with various rates of evaporation up to 9 pounds per square foot, but only when the diameter of the tubes was reduced to 1½ inches, and the tubes nearly vertical, was he able to obtain the conditions shown in Fig. 2. In all cases, most of the circulation seems to be due to the upper parts of the tubes or the front headers, where these are used, or both, being filled with foam to the complete exclusion of continuous water. This is illustrated in sketch, Fig. 3. The line A B shows the water level before starting, but as soon as rapid boiling has commenced the upper ends of the tubes and the upper headers are filled with foam, and there is a continuous flow of water along the upper drum. With tubes of 1¼ diameter and upwards, local circulation becomes very appreciable, especially in the upper of the three tubes shown. In this tube, while there is a continuous upward stream of steam bubbles, there is also a continuous downward stream of water. The direction of flow of the water in the middle tube, under some conditions, becomes alternating. The path of each bubble at any instant is, of course, in the direction of the resultant of all the forces acting on it at the instant. On this account the path may, when the tubes exceed a certain diameter, determined by the rate at which steam is being generated, be curved as indicated in Fig. 4. The size of the steam bubbles formed varies greatly with the rate at which steam is being generated. When the rate is great the bubbles are very much smaller than when the rate is very small. The size of the bubbles also depends, of course, on the pressure under which the steam is generated.

"So far as the action inside the tubes is concerned, the angle of inclination of the tubes seems to be of little moment, so long as the inclination is not less than about 15 deg., and not greater than about 70 deg., when the diameter of the tubes is about one inch, and it is probable that the best inclination, in any given case, depends on the diameter of the tubes. When the tubes were horizontal, the water was almost entirely driven out of the lower ones. So far as the utilization of the radiant heat from the solid fuel on the grate is concerned, the boilers with tubes only slightly inclined to the horizontal have the advantage. It is often assumed that boilers with headers will not stand as much forcing as those in which each tube discharges directly into the upper drum. In practice it is found that there is no difference in this respect.

"In designing boilers of this type, especial care should be taken that none of the tubes act as condensers for the vapors in the products of combustion, as if they do, the sulphurous acid thus deposited on the tubes may soon ruin the boiler. Boilers which are more or less triangular in form must occupy a greater space for a given power than those which are more or less rectangular in form, other things being equal. This is obviously a matter of considerable importance in the case of marine boilers.

"The main advantages which may be derived from the use of water tube boilers are due, firstly, to the comparatively small mass of water in them, and the consequent small loss due to steam raising, and, secondly, to the much higher average efficiency under greatly varying loads. This latter point is very well illustrated by the following abstracts from the tests of a Thornycroft boiler made by Professor Kennedy: At 89.1 horse power, efficiency of boiler 86.8 per cent.; 282.1 horse power, 81.4 per cent.; 449.2 horse power, 78.2 per cent.; 774.7 horse power, 66.6 per cent."

Following the discussion of advantages derived from the use of water tube boilers the writer describes and illustrates the Babcock & Wilcox, Belleville, Thornycroft, Fleming & Ferguson, Normand and other generators of the tubulous type that have come into marine use. Most of these boilers have been fully described with engravings in the REVIEW. The Belleville boiler is described in our issue of June 30, 1894, the Fleming & Ferguson boiler in the issue of March 21, 1895, and the Babcock & Wilcox boiler in the issue of Oct. 11, 1894. Following is an extract from a large table, which accompanies the paper, giving results of evaporative tests of various kinds of water tube steam boilers:

RESULTS OF EVAPORATIVE TESTS OF VARIOUS KINDS OF WATER TUBE STEAM BOILERS.

Description of steam boilers.	Area of fire grate in square feet.	Total heating surface in square feet.	Description of coal used.	Coal consumed per square foot of fire grate surface per hour in pounds.	Water evaporated per pound of coal from and at 212 deg. F. in pounds.
Thornycroft's water-tube boiler	22.7	1410	Welsh	—	13.40
Babcock & Wilcox's "	25	1403	Scotch coal	13.4	12 38
" "	25	1403	"	12.8	12.05
" "	31	1380	Anthracite	12.8	11.22
" "	23	1193	Steam coal	13 7	10.70
" "	31.1	1426	Coke	6.8	10.05
" "	25	1610	Welsh	23	10.00
" "	15	860	Slack	24.6	7.20
Belleville water-tube boiler.....	39.7	1264	Welsh	—	11.71
" "	39.7	1264	Briquettes	—	10.83
De Naeyer water-tube boiler...	40	1700	Bituminous	14.25	11.70
Herreshoff coil " ...	26.0	485	Anthracite	13.0	9.10
" " ...	26	485	"	18.0	8.10
Heine's " ...	19.4	869	Steam coal	18.8	9.00
Water tube boiler with vertical tubes.....	21.2	928	"	22.7	8.33
Water tube boiler with pendent tubes.....	19.6	958	"	21.9	8.10
Water tube boiler with vertically inclined tubes.....	28	1600	"	20.7	7.34
" "	17.3	870	Slack	34	7.02
Ward's water tube boiler.....	—	—	Coal	15.5	8.28

Defects in Wisconsin's New Tax Law.

Milwaukee vessel owners a few weeks ago secured the passage of a law in the Wisconsin legislature which fixes vessel taxes according to the net tonnage and age of vessels. It was thought that the law would recommend itself for adoption to the legislatures of other lake states, but a careful consideration of the measure shows that the assessment of taxes on a tonnage basis will be very unequal in many cases. There is already considerable complaint among vessel owners throughout the state on account of this feature of inequality in the law. It is provided that vessels under five years of age pay $8 per net ton; vessels over five years of age and under ten years, $6 per net ton, and vessels over ten years of age $5 per net ton. Now it will readily be seen that a big passenger steamer worth $200,000 to $250,000 will under such a law as this be required to pay no more in taxes than a wooden freight steamer worth only $60,000 to $75,000, as the government rules under which the tonnage of vessels is computed makes the tonnage of the largest passenger boats no greater than that of the freight steamer that carries 1,200 or 1,500 tons of freight. The same rules make the tonnage of schooners and tow barges much greater than that of steamers of the same dimensions, on account of engine room space being deducted in the case of the steamer, and thus such a law acts to the disadvantage of the poorer class of boats, and especially the poorer class of sail vessels. Then, too, a valuable tug may escape taxation almost entirely, as the tonnage of tugs, which have no freight capacity, is very light. Evidently the new Wisconsin law is seriously defective as regards equality in taxation.

Sailing Directions.

Another book of sailing directions covering Lake Michigan, Green bay and the Straits of Mackinac has just been issued by the hydrographic office. This second part of the sailing directions for the lakes entire (the first book covered Lake Superior) will be followed in turn by Lake Huron with the St. Clair and Detroit rivers and Lake St Clair, and finally by Lakes Erie and Ontario with the St. Lawrence river to Montreal. The books sell at $1 each and may be had from the MARINE REVIEW. When completed this work will be far more valuable than any "coast pilot" ever issued. These books are not recommended on account of any profit in their sale, as there is nothing in the sale of them, but they are certainly the best publications as yet issued by the hydrographic office in connection with its work on the lakes.

Building of War Vessels on the Lakes—Letter from Senator McMillan.

Editor MARINE REVIEW: I am in receipt of your letter of March 22, together with a marked copy of the MARINE REVIEW containing an article in which you express the opinion that instead of building gunboats for the lakes it would be better to secure such a modification of existing treaties as would allow the lake ship yards to construct torpedo boats for use along the coast. In your letter you ask if it is my intention "to urge any movement towards overcoming this treaty matter." You also ask for a short letter to prompt builders and other lake interests to move in this matter.

In reply I would say that on January 9, 1895, I wrote to the honorable the secretary of state in part as follows: "As you doubtless understand, the treaty of Ghent, as at present interpreted, absolutely prohibits the ship yards of the great lakes competing for the construction of naval vessels; and inasmuch as these ship yards have ample facilities for building steel and iron vessels at a low cost, they naturally feel that a grievous wrong is done them by the terms of a treaty entered into at a time when it was not contemplated that vessels for ocean service would ever be built on the lakes. Would it not be possible for the state department to secure through negotiation such modification of the treaty with Great Britain as would allow the building on the great lakes of naval vessels designed for ocean use?"

When this letter failed to receive acknowledgement from the state department, on Feb. 25, I again called the attention of the secretary to the subject, asking "whether any negotiations have been opened with Great Britain for the abrogation of those portions of the treaty which impose restrictions on building naval vessels on the great lakes.

On March 8, I received a reply stating that no such action had been taken. In the pressure of business of a larger nature, I presume that the state department has found no opportunity to take up this matter. In stating the result of the correspondence to one inquirer, I said: "Were the question simply one of securing a change in the treaty I presume that with patience such a result might be secured through the state department, but it occurs to me to say that even should such vessels be built in the lake ship yards for use on the ocean, the question of getting them to tide water would still remain. This could be accomplished only through the Canadian canals, and you will remember that during the Canadian rebellion the United States compelled the dominion government to land its troops and munitions of war on Canadian territory and transport them around the rapids of the St. Mary's river, thus forbidding the use of American canals for military purposes on the part of the dominion. If the lake ship yards desire to take up this matter systematically I will do all I can to help them; but the subject is too large and too complicated to go into without a well considered plan and the interested backing of all the senators and representatives from the lake states"

There the matter rests for the present. At the next session of congress I propose to take up the subject in a different way. In the meantime any agitation of the question through the columns of the REVIEW would doubtless be helpful.

JAMES MCMILLAN.

United States Senate,
Washington, D. C., March 25, 1895.

Beneficent Effects of the Lake Carriers' Association.

In an article prepared for a special marine edition just issued by the Cleveland Plain Dealer, Harvey D. Goulder, admiralty lawyer of Cleveland, and counsel for the Lake Carriers' Association, presents a short history of the old Cleveland Vessel Owners' Association,and reviews matters pertaining to associations of vessel owners on the lakes since the first effort towards forming an organization of any kind was made in 1881. The article, which deals mainly with the several efforts that resulted in the formation of the present general body known as the Lake Carriers' Association, concludes as follows:

"It was because the necessity for united action became apparent that the effort of 1881, to establish a general lake organization was made. Its failure for a time discouraged those public spirited men who realized the necessity for such an organization and the important work which it could accomplish. The success of the Cleveland Vessel Owners' Association, while due to the unsparing efforts of its officers and members, established the fact that an organization could succeed on the lakes, while it dealt with only such objects of general concern as would unite in their support a large number of owners having varied interests. The good work of the Lake Carriers' Association in Buffalo emphasized this fact. The amalgamation of the two was almost the necessary outcome of their existence and their individual success in that field. The interest in the reorganized Lake Carriers' Association from the outset was very general. The conduct of its affairs has been exceptionally wise. While it has at times been compelled to deal with questions which were not of interest to each member, yet all of its work has been along the general lines of the purpose for which it was organized. Following wisely and conservatively along the lines laid down in the beginning, which were a mere adaptation of those pursued by the former associations,the Lake Carriers' Association has increased in membership, in the interest of its members and in usefulness. It can point with satisfaction to its work. Thirty-nine per cent. of the steam tonnage of the United States is now employed on the great lakes. The greater part of the country is dependent on these waterways for cheap transportation. Not only are freights low for water carriage, but they regulate and hold down during the entire year freights of competing railroads which do not even touch the lakes. This has been the subject of congressional reports with which the public is more or less familiar. An organization which has for its prime object the improvement of such waterways and the safety of life and property thereon should be commended. There was formerly no system for reporting newly discovered shoals and obstructions to navigation or for securing their removal; efforts for securing light houses, fog signals, life saving stations and aids to navigation were local, and vessel owners by small subscriptions were paying over $6,000 annually to maintain private range lights, necessary to the navigation of Detroit and St. Clair rivers by night. These and other similar questions have to be dealt with by congress and by boards authorized in each particular instance by congressional action. The legislative committee of the Lake Carriers' Association deals with these things, and urges upon congress the needs and desires of the people most immediately interested in the safety of life and property on these waterways. The requests of the association have been so fair and conservative and so strongly backed up by facts and reasons that its representatives are regularly invited to attend and are made welcome before boards and committees in Washington and elsewhere dealing for the government with questions affecting lake navigation. The beneficent effects of the Lake Carriers' Association are recognized all over the union, and found upon our statute books and in the permanent works of the government throughout the length of the lakes."

No Hull Tariff.

The general agents of Chicago and Buffalo, who represent insurance companies doing a regular business on the lakes, met in Deiroit Wednesday and were unable to agree on a hull tariff. It is the general opinion that no tariff can now be agreed upon, and that during the coming season vessel owners are to have the advantage of open competition for business between foreign underwriters and the companies that have maintained regular agencies and in former years worked under an established tariff of rates. The general agents claim that it was their intention to reduce rates if a tariff had been agreed upon, but that the failure to reach a settlement was due to their inability to agree upon the extent of reductions in different lines. Lower insurance is, of course, expected as a result of this disagreement, but the extent of the reduction will not be known until there is an indication of vessels moving and the scramble for business between the underwriters is begun.

Around the Lakes.

Capt. D. Monro has begun at Gibralter, Mich., the construction of a barge 110 feet long, 25 feet beam and 7 feet depth.

On all lakes excepting Lake Superior the weather bureau will resume the display of wind signals on April 10. On Lake Superior they will not be displayed until May 1.

The F. P. Little Electrical Construction and Supply Company of Buffalo has favored the Buffalo branch of the Marine Engineers' Beneficial Association with lectures on electricity during the past winter. The lectures have proven highly beneficial to the engineers and will be continued at their rooms every two weeks until May 1. All engineers are invited.

Brown & Co. of Buffalo have just issued a circular letter showing rates that will be charged during the coming season for unloading lumber at Buffalo, and comparing these rates with the charges in 1893 and 1894. The new schedule, which was agreed upon at a meeting of members of the lumber exchange, vessel owners and stevedores, improves the system of charges and includes moderate reductions.

F. W. Wheeler & Co., West Bay City, closed a contract a few days ago with Green Bay, (Mich.) parties for the construction of a steel steamer intended for the lumber trade. The boat is to be 214 feet keel, 38 feet beam and 15 feet hold, and is to have capacity for about 1,500,000 feet of lumber. She is to be equipped with triple expansion engines having cylinders of 16, 25 and 42 inches diameter and a stroke of 32 inches.

The harbor tug Ben Campbell, built at Charlevoix last season, has been purchased by the Cleveland Tug Company. The price is reported at $8,000. The Campbell is 87 feet over all, 18 feet beam and 10 feet molded depth. Her engines are 20 by 22 and the steam pressure is 140 pounds. She will be brought to Cleveland immediately upon the opening of navigation. The Cleveland company has sold the small tug Maggie Sanburn to parties in Pine Lake. The office of the Cleveland company has been removed to No. 1 Front street.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,105	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

LAKE VESSEL OWNERS have in time past had a full share of labor troubles. Since the reorganization, three years ago, that resulted in a union of the old Cleveland Vessel Owners' Association and the Lake Carriers' Association, owners have been free from serious disagreements with employes, but if success attends certain efforts now being made to organize men employed in various capacities aboard steamboats it may be that business during the coming season will be attended by some of the troubles of the past. San Francisco is the headquarters of organized seamen engaged in the coasting trade, and the Coast Seamen's Journal, a weekly publication of that city that is very well managed, is the organ of the union. In a recent issue of the San Francisco publication an article occupying a full page is devoted to argument urging organization among all employes on lake vessels. The union succeeded in the last congress, mainly through the efforts of Congressman Maguire of San Francisco and Congressman Nelson Dingley of Maine, the latter of whom is an acknowledged authority on marine affairs, in securing some important legislation favorable to seamen, and the present movement towards organization on the lakes is based largely on the claim that employes of lake vessels may bring about the enactment of laws favorable to their interests, if the demand for these laws is made unanimous and in a systematic way. It is evidently the intention of the organizers of the proposed new lake union, who are working under the direction of T. J. Elderkin of Chicago, and who have already held meetings in different lake cities, to circulate reading matter of this kind, during the early part of the season, among the men who work aboard lake vessels, and endeavor to bring them into the union in advance of better times which, it is claimed, are certain to come later on. The arguments of the organizers are not of the stereotyped kind usually heard from labor agitators, and it would seem that the present movement has some backing to it.

NO VESSEL OWNER could be made to believe two years ago that he would ever engage his ship to carry ore from the head of Lake Superior to Ohio ports at 50 cents a ton, and yet it is a fact that ore was actually carried at that figure. It was a radical change that brought about such a freight rate. The lake vessel business is noted for radical changes in the matter of carrying charges. Why is it not reasonable to look for a change equally radical in the other direction when general business conditions show actual improvement? This is the view of the present lake freight situation taken by owners who are adverse to accepting a 75-cent rate on ore business for the coming season. The big increase in freight tonnage is, of course, decidedly against high freights, but it would not take much of an increase in operating expenses to make 75-cent contracts very unprofitable.

THE CLEVELAND CHAMBER OF COMMERCE has rubbed up against Gen. Casey, chief of engineers of the war department, in referring to the necessity for an investigation generally of the water overflow question on the lakes. Gen. Casey has all of the characteristics of the important army officer and his independence is shown when any question presented to him is not to his liking. Some of the leading civil engineers of the country have criticised such information as has been prepared by the army corps regarding the Niagara outflow, and have held that the war department should for various reasons connected with river and harbor improvements give the whole subject on the lakes more attention than has been given to it in the past. The Lake Carriers' Association adopted resolutions favorable to this view of the matter at its last meeting, and the Cleveland organization is right in the stand it has taken.

THE OPENING freight rate of 75 cents on ore contracts that will tie up vessels for all but the two closing months of the season is by no means encouraging to the vessel interests, but there is one feature now prominent in the ore business that was lacking a year ago. Everybody expects that the output of Lake Superior mines will be as heavy in 1895 as it has ever been in a single season.

LAKE UNDERWRITERS who are now fixing up a hull tariff at Detroit should certainly reduce premium rates on the best class of wooden hulls. These vessels have been made to pay more than their share of premiums.

Numerous Car Ferry Schemes for Lake Michigan.

Managers of nearly all the railways having terminals in cities and towns on Lake Michigan are giving attention to the question of car ferry service. Capt. James Davidson has begun work at West Bay City on the two car ferry tow barges for which he recently closed a contract with the management of the Wisconsin & Michigan Railway. This railway transverses the upper peninsula of Michigan and has important connections with northwestern railways. The transfer of cars on these barges, which are to be towed by a large tug, will be between Peshtigo and South Chicago. If the experiment is successful the two barges now building will be followed by others. There is talk also to the effect that the Chicago, Milwaukee & St. Paul Railway Company will extend its Lake Superior division to a connection with the Ahnapee & Western Railway, which terminates at Sturgeon Bay, with the view of making a steam carferry connection at some east shore port with a trunk line to the seaboard. The Merrill, Antigo & Eastern Railway and the Wisconsin & Michigan road are also said to be interested in this scheme. The Wisconsin Central Railway Comany has just completed the purchase of land at Manitowoc needed for a lake terminal at that point, and another carferry line to an east shore port is thus among the possibilities, although arrangements for transferring freight to Ludington on the Flint & Pere Marquette Railway Company's steamers may be made. These steamers already handle freight in considerable quantities between Manitowoc and Ludington, but the business has never been sufficient to warrent running regularly between the two points.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store and afloat at the principal points of accumulation on the lakes on March 23, 1895:

	Wheat, bushels.		Corn, bushels.	
	In store.	Afloat.	In store.	Afloat.
Chicago	24,361,000	2,995,000	4,898,000	2,329,000
Duluth	11,573,000	85,000	1,000	.....
Milwaukee	691,000	.....	.....	.....
Detroit	1,354,000	257,000	161,000	.....
Toledo	2,088,000	299,000	662,000	.....
Buffalo	2,680,000	295,000	95,000	541,000
Total	42,747,000	3,031,000	5,817,000	2,870,000

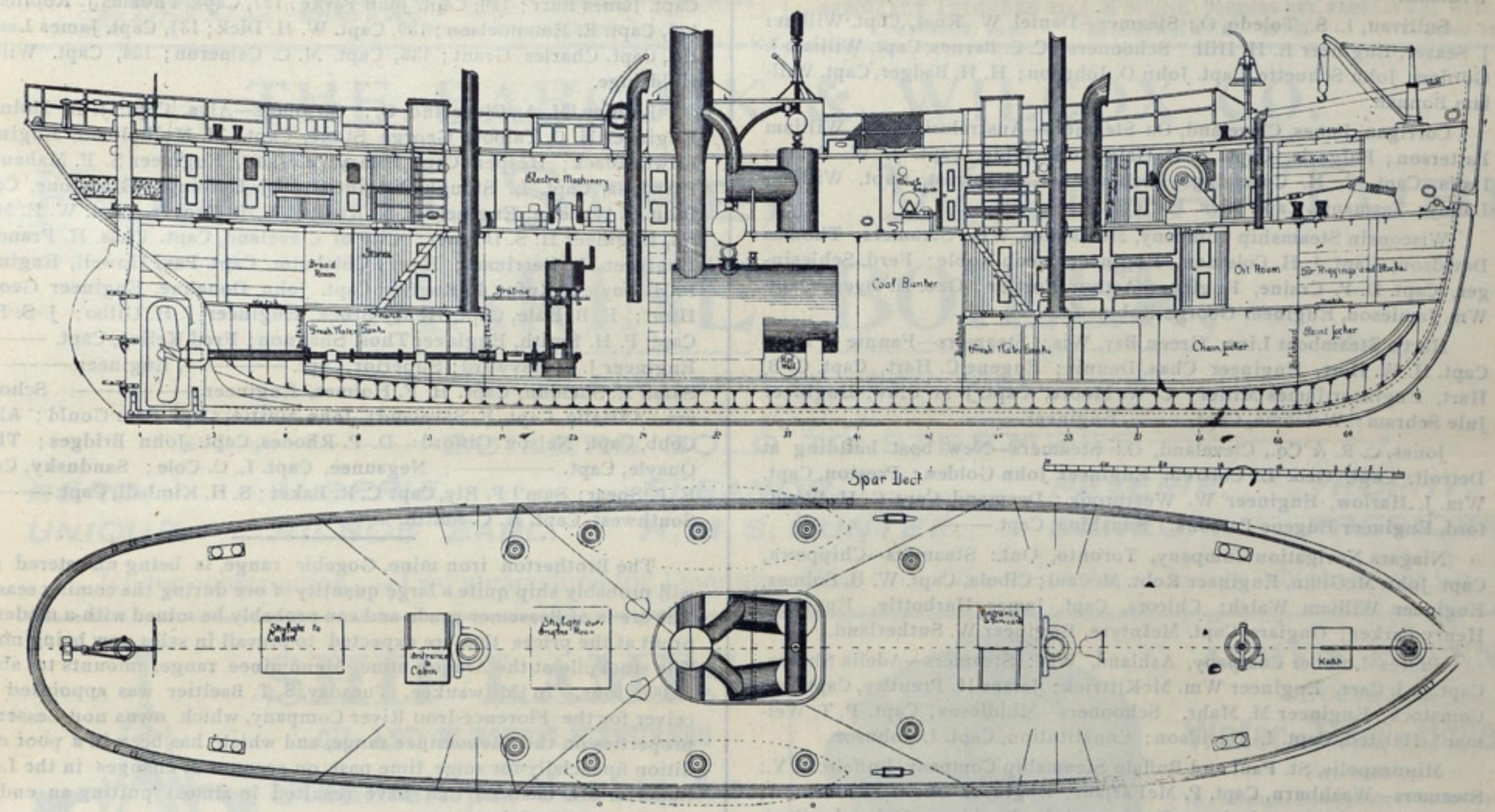
Russia is just now making a big outlay for new war ships. The government is laying down at the St. Petersburg navy yard two iron clads, a cruiser, a gunboat and fifteen torpedo boats. From the same yard there was recently launched five cruisers. An ironclad of 11,000 tons, a cruiser and a training ship will be begun shortly. An ironclad and four torpedo boats are equipping at Nicolaiffe, where another ironclad has been begun. Other war ships are building at Abo, on the Gulf of Bothnia, at Copenhagen and in England.

Composite Steam Light-Vessel.

On April 11 the light-house board, Washington, D. C., will open bids for another of the high-class, electrically-lighted light-ships that have of late been introduced into the service. Engravings on this page will give an idea of what the boat will be like. She is not intended for lake service, but as the plans and specifications are now ready for distribution to builders throughout the country, and as there is nothing to prevent the boat being built here and taken to the coast by way of the Welland and St. Lawrence canals, it is more than probable that several lake concerns will endeavor to secure the contract.

This vessel is to be of composite construction, 112 feet on the water line, 28 feet 6 inches moulded breadth and 13 feet depth of hold. The frame is to be of steel with steel plate keel, steel bilge strake and steel sheer strake. Wood planking is to be used from the keel up to the sheer line at the main deck, and from that point up to the spar deck steel plate is to be used. The frames, floors, keelsons, stringers, beams, sheer strake, bilge strake, strapping, keel plate, etc., are to be of steel; stem, sternpost, rudderpost, rudder, false keel, shoe, sheathing and grip on stern, bilge keels to be of white oak; keel, planking and deadwood to be of long-leaf Georgia or Florida pine. Fastenings in plank, keel and deadwood are to be of galvenized iron; in the wood sheathing, composition spikes. The metal sheathing is to be 26, 28 and 30 ounce metal, double punched.

The propelling engine, which will, of course, be of use only in moving the vessel to and from her station or for handling her in case of accident that might remove her from her moorings, will be of about 350 horse power, and of the vertical inverted surface condensing type, with a single cylinder 20 inches diameter and 22 inches stroke of piston. There will be two main boilers of about 300 horse power each and two auxiliary of about 40 horse power each. The main boilers, which are to be of the Watkins & Dixon type, are not to be more than 14 feet long, 8 feet wide and 8 feet 6 inches high from under side of furnace leg to top of shell, the shell to be 8 feet diameter. Magnesia covering is specified for boilers and piping. The electric light plant is to consist of two of the General Electric Company's marine sets known as m. p. 4-8-550, with 5 by 4 inch double cylinder Sturtevant engines.



COMOSITE LIGHT-VESSEL FOR UNITED STATES GOVERNMENT.

Changes in Lights and Signals—New Charts.

On the opening of navigation the characteristic of the 8 inch steam whistle at Fort Gratiot light station, head of St. Clair river, will be changed to sound, during thick or foggy weather, blasts of 3 seconds' duration, separated by silent intervals of 17 seconds. The Canadian government gives notice that in consequence of the continued settling of the main breakwater pier at Oakville, Lake Ontario, it has been again necessary to move the light-house tower, and the block on which it stands, shoreward. They are now located on the pier near its inner end. Vessels entering Oakville harbor will require to allow for this and exercise great caution in clearing the outer end of the pier.

The west pier at Port Dover, Lake Erie, has been extended farther into the lake by the addition of a cribwork block 100 feet long by 30 feet wide to the outer end of the original pier. The inner face of the new work is in the same line as the inner face of the old work. The light-house has not been removed and is consequently now 110 feet, instead of 10 feet, from the outer end of the breakwater pier.

The following admiralty charts of Georgian bay, made from surveys by Staff Commander J. G. Boulton, R. N., and published by the hydrographer of the admiralty are now ready for sale: 1,731, Parry sound and approaches; 2,102, Western island to Waubaushene; 407, Penetanguishene harbor. The two supplements to the "Georgian Bay and North Channel Pilot," written in connection with the above charts, are also on sale. These publications may be had through the MARINE REVIEW.

Speed of the Western Metropolis and City of Buffalo.

In the REVIEW of the 14th inst., M. Sanford Rice of Harbor, O., inquired as to whether the side-wheel steamers Western Metropolis and City of Buffalo, which were engaged in passenger business on Lake Erie in the fifties, had ever made 20 miles an hour. Mr. Thomas Fitzpatrick, who was at one time chief engineer of the Western Metropolis, answered that that steamer had, while he was engineer, made the run from Buffalo to Cleveland, 180 miles, in 9 hours and 5 minutes, which was practically 20 miles an hour. Mr. Rice has since received a communication from another engineer, who was on the City of Buffalo. He says the City of Buffalo repeatedly ran from Buffalo dock to Long point light, sixty-five miles, in three hours. He also claims that she made the run from Buffalo to Toledo, the whole length of the lake, in fifteen hours, which would be better than 21 miles an hour. The boats were of the same dimensions, but the City of Buffalo had a cylinder six inches larger in diameter, and carried 50 pounds of steam on it.

Almost every seagoing power in the world is now considering the question of eliminating woodwork from men-of-war. None have been successful, however, in obtaining a suitable substitute. A board of naval engineers recently appointed by Secretary Herbert will make a report on this subject within a few days.

A COPY OF THE PHOTO-GRAVURE SUPPLEMENT OF DIRECTORS OF THE LAKE CARRIERS' ASSOCIATION, TOGETHER WITH THE LARGE ENGRAVING OF THE STEAMER NORTH WEST, BOTH OF WHICH WERE CONTAINED IN RECENT BIG ISSUES OF THE REVIEW, WILL BE MAILED IN A PASTEBOARD TUBE TO ANY ADDRESS UPON RECEIPT OF 50 CENTS IN STAMPS.

Appointments of Masters and Engineers.

Johnson, H. J., Cleveland, O.: Stermer—H. J. Johnson, Capt. Charles Miner. Schooner—Helvetia, Capt. Savage.

Cummings, M. J., Oswego, N. Y.: Steamers—Charles. S. Parnell. Capt. P. Griffin; Mont Eagle, Capt. Wm. Griffin.

Milwaukee Steamship Company, Milwaukee, Wis.: Steamers—F. L. Vance, Capt. E. B. Marquette, Engineer W. J. Gervin; R. P. Flower, Capt. Frank Van Patten, Engineer Daniel Darcy.

McBrier, James, Erie, Pa.: Steamers—Fedora, Capt. F.A.Fick, Engineer Stephens; Nyanza, Capt. Donald McDonald, Engineer J. W. Blanchard; Uganda, Capt. C. H. Wilson, Engineer William Mead.

Palmer & Gordon, Cleveland, O.: Steamers—George Presley, Capt. Charles Wallace, Engineer C. J. Church; Wetmore, Capt. Frank Rice, Engineer William Bridges. Schooner—Brunette, Capt. F. A. Pitcher.

Stevenson, John, Detroit, Mich.: Steamers—C. H. Starke, Capt. Wm. Curtis, Engineer John Lacy; Toledo, Capt. George Barns, Engineer Charles Jubenville; Hattie, Capt. N. L. Stewart, Engineer Irving Morrison.

Spaulding Lumber Company, Chicago, Ill.: Steamer—H. L.Worthington, Capt. James Travis, Engineer H. F. Otto. Schooners—William Jones, Capt. Oscar Clow; T. J. Bronson, Capt. John Bates; J. B. Wilbur, Capt. D. Williams.

Sullivan, L. S., Toledo, O.: Steamer—Daniel W. Rust, Capt. William J. Seaver, Engineer E. H. Hill. Schooners—C. C. Barnes, Capt. William J. Gordon; John Schuette, Capt. John O. Johnson; H. H. Badger, Capt. William Bonnah.

Corrigan, James, Cleveland, O.: Steamers—Australasia, Capt. William Patterson; Bulgaria, Capt. A. H. Gain; Caledonia, Capt. J. W. Brion; Italia, Capt. C. H. Cummings. Schooners—Northwest, Capt. William Dandy; Tasmania, Capt. Alex. Porter.

Wisconsin Steamship Company, Milwaukee, Wis.: Steamers—Thomas Davidson, Capt. J. H. Coleman, Engineer Jacob Noble; Ferd. Schlesinger, Capt. D. P. Craine, Engineer Arthur Fortier; Geo. H. Dyer, Capt. Wm. Jamieson, Engineer George Robinson.

Hart's Steamboat Line, Green Bay, Wis.: Steamers—Fannie C. Hart, Capt. H. W. Hart, Engineer Chas. Dennis; Eugene C. Hart, Capt. C. B. Hart, Engineer James Miller; C. W. Moore, Capt. J. M. Clow, Engineer Jule Schram; Welcome, Capt.———, Engineer———.

Jones, C. R. & Co., Cleveland, O.: Steamers—New boat building at Detroit, Capt. Geo. L. Cottrell, Engineer John Golden; Preston, Capt. Wm. J. Harlow, Engineer W. Westbrook; Desmond, Capt. C. H. Woodford, Engineer Eugene Parsons. Sunshine, Capt.———

Niagara Navigation Company, Toronto, Ont.: Steamers—Chippewa, Capt. John McGiffin, Engineer Robt. McCaul; Cibola, Capt. W. H. Solmes, Engineer William Walsh; Chicora, Capt. James Harbottle, Engineer Henry Parker; Ongiara, Capt. McIntyre, Engineer W. Sutherland.

Shores Lumber Company, Ashland, Wis.: Steamers—Adella Shores, Capt. J. J. Carr, Engineer Wm. McKittrick; James H. Prentice, Capt. Jas. Comstock, Engineer M. Mahr. Schooners—Middlesex, Capt. P. T. Weimar; Halsted, Capt. L. Davidson; Constitution, Capt. L. Johnson.

Minneapolis, St. Paul and Buffalo Steamship Company, Buffalo, N. Y.: Steamers—Washburn, Capt. P. McFarlane, Engineer Bion St. Bernard; Pillsbury, Capt. James Jackson, Engineer John Davidson; Nebraska, Capt. E. C. Moody, Engineer Thomas Churchill; Dyer, Capt. William Jamieson, Engineer ———.

Northern Steamship Company, Buffalo, N. Y.: Steamers—North Land, Capt. W. H. Campau, Engineer Henry Reynolds; North West, Capt.———, Engineer A. A. Brown; Northern King, Capt. F. D. Welcome, Engineer Wm. Pike; Northern Queen, Capt. E. M. Smith, Engineer J. Boyd; Northern Wave, Capt. M. Niland, Engineer Fred. Potts; Northern Light, Capt. M. J. Haberer, Engineer Frank Harringer; North Wind, Capt. Delos Waite, Engineer Thos. Jackman; North Star, Capt. William Thorn, Engineer J. O'Mara.

Montreal Transportation Company, Kingston, Ont.: Steamers—Active, Capt. John Gaskin, Engineer———; Bronson, Capt. Jos. Murray, Engineer Alex. Barton; Glide, Capt.———, Engineer———; Glengarry, Capt. J. W. Mawdesley, Engineer Chas. McSorley; Jessie Hall, Capt. Chas. Martin, Engineer Robt. Hepburn; Jas. A. Walker, Capt. John Boyd, Engineer Robt. Marshall; D. G. Thomson, Capt. James Murray, Engineer Geo. Henderson; Bannockburn, Capt. Arch. McMaugh, Engineer Henry Thurston. Schooners—Minnedosa, Capt. John Irwin; Kildonan, Capt. F. Lafrance; Selkirk, Capt. James Fleming; Winnepeg, Capt. M. Patterson; Dunmore, Capt. John Phillips. This list of appointments does not include river barges.

Kingston and Montreal Forwarding Company, Limited, Kingston, Ont.: Thrush, Capt. Leon Pregent; Condor, Capt. Dernosse Perron; Hiawatha, Capt. Emanuel Ledue; Lapwing, Capt. Joseph Ledue; Dakota, Capt. Moise Chatel; Huron, Capt. Trifflie Herbert; Cherokee, Capt. Thomas Lauren; Iroquois, Capt. Francis Mathew; Beauport, Capt. Narcese Gimlan, Sr.; Jet, Capt. Diselte Senical; Siren, Capt. Frank Porier; Bismarck, Capt. J. St. Michel; Princess, Narcese Gamlin, Jr.; Virginia, Capt. Joseph Perrow, Jr.; Mona, Capt. Paul Reid; Quebec, Capt. James Gallivan; Imperial, Capt. J. Buvien; Montcalm, Capt. C Darcaw; C. P. R., Capt. A. Verville; National, Capt. W. Charland; Rosa, Capt. M. Robideux; Helena, Capt. O. Latroverse; Earnest, Capt. A. Darean; Adele, Capt. H. Perron; Doris, Capt. Jos. Perron; Victor, Capt. A. Laroches; Rachel, Capt. I. Beaubean; Alice, Capt. M Laeghea; Leberal, Capt. F. H. Laryette; Jos. Edward, Capt. J. Charland; St. J. Baptiste, Capt. B. Darcaw; Elm, Capt. H. Hoppins; Rapid, Capt. Wm. Roach; Snipe, Capt. Wm. McConnell.

American Steel Barge Company, Cleveland, O.: Steamers—Colgate Hoyt, Capt. W. S. Hoag, Engineer Gilbert Newton; E. B. Bartlett, Capt. M. A. Boyce, Engineer Walter Harsant; A. D. Thompson, Capt. W. C. Butts, Engineer Ernest Sampson; Thomas Wilson, Capt. A. P. Chambers, Engineer Robert Walker; Samuel Mather, Capt. John Smith, Engineer Irwin Marshall; J. B. Colgate, Capt. W. H. Kilby, Engineer J. H. Pierce; J. B. Trevor, Capt. John McArthur, Engineer George Blauvelt. Barges—101, Capt. John Sprowell; 102, Capt. George Gallant; 103, Capt. F. E. Johnson; 104, Capt. Louis Leonard; 105, Capt. A. R. Robinson; 107, Capt. Carl Secord; 109, Capt. John Gillis; 111, Capt. G. W. Smith; 115, Capt. A. G. McLeod; 116, Capt. Arch McArthur; 117, Capt. Neil Campbell; 118, Capt. James Burr; 126, Capt. John Parke; 127, Capt. Thomas J. Robinson; 129, Capt. E. Emanuelson; 130, Capt. W. H. Dick; 131, Capt. James Leahy; 132, Capt. Charles Grant; 133, Capt. M. C. Cameron; 134, Capt. Wilbur Holdridge.

Bradley, M. A., Cleveland, O.: Steamers—Alva, Capt. J. A. Holmes, Engineer H. C. Talbot; George Stone, Capt. M. Mulholland, Engineer Edwin Black; Hesper, Capt. Henry Peterson, Engineer S. F. Mahaney; Pasadena, Capt. L. Stough, Engineer A. J. Helbing; Gladstone, Capt. John H. Wysoon, Engineer J. N. Kirby; M. B. Grover, Capt. W. E. Morris, Engineer H. S. Downer; City of Cleveland, Capt. Chas. H. Francke, Engineer Mr. Berriman; Henry Chisholm, Capt. Paul Howell, Engineer P. H. Doyle; Rufus P. Ranney, Capt. John Donahue, Engineer Geo. F. Hunt; E. B. Hale, Capt. Henry Brock, Engineer J. H. Gilbo; J. S. Fay, Capt. P. H. Smith, Engineer Thos. Shannon; Fred Kelley, Capt. ——— Engineer J. B. Hayward; Superior, Capt. ———, Engineer ———; Sarah E. Sheldon, Capt. H. F. Holmes, Engineer ———. Schooners—Adriatic, Capt, E. Saveland; John Martin, Capt. Sam Gould; Ahira Cobb, Capt. Nelson Gifford; D. P. Rhodes, Capt. John Bridges; Thos. Quayle, Capt. ———; Negaunee, Capt. L. C. Cole; Sandusky, Capt. E. P. Spear; Sam'l P. Ely, Capt C. R. Baker; S. H. Kimball, Capt.———; Southwest, Capt. R. C. Smith.

The Brotherton iron mine, Gogebic range, is being unwatered and will probably ship quite a large quantity of ore during the coming season. The ore is of Bessemer grade and can probably be mined with a moderate profit at the prices that are expected to prevail in sales now being made. The stockpile at the Aragon mine, Menominee range, amounts to about 75,000 tons. In Milwaukee, Tuesday, S. T. Baeltier was appointed receiver for the Florence-Iron River Company, which owns non-Bessemer properties on the Menominee range, and which has been in a poor condition financially for some time past, on account of changes in the Lake Superior ore business that have resulted in almost putting an end to non-Bessemer mining.

The unfortunate circumstances that resulted in delaying the launch of the St. Paul, second of the American Line ships, which was to have occurred at Philadelphia on Monday last, may cause some criticism of the Cramps among Britishers who are not altogether friendly to American progress in ship building, but the accident was not an uncommon one. Difficulty is often found in moving vessels from the ways, even when the greatest care is taken in preparations for launching. The St. Paul is an exact duplicate of the St. Louis, which is fully described in the REVIEW of Nov. 15-22.

During an unofficial trial Tuesday, the ram Katahdin, built by the Bath Iron Works, Bath, Me., made 17.8 knots. The builders are to be allowed $15,000 per quarter knot for speed in excess of 17 knots on official trial.

E. C. O'Brien, late commissioner of navigation, has been appointed to membership in the New York city dock commission.

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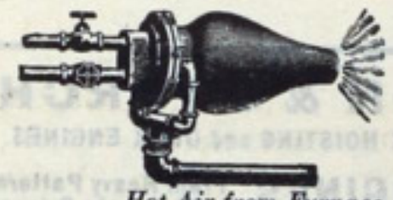

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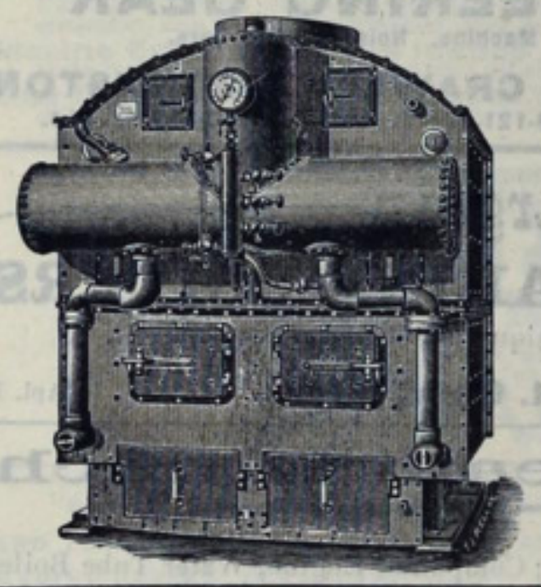

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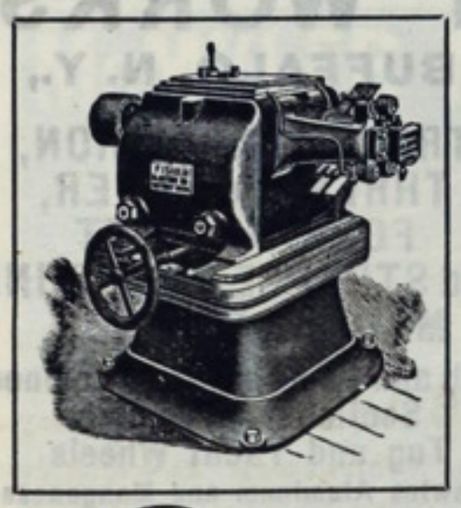

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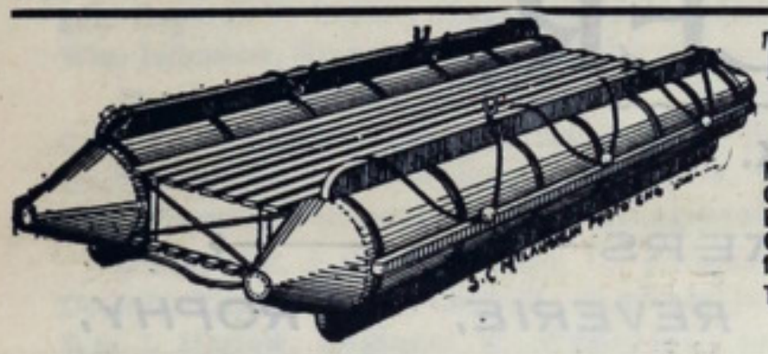

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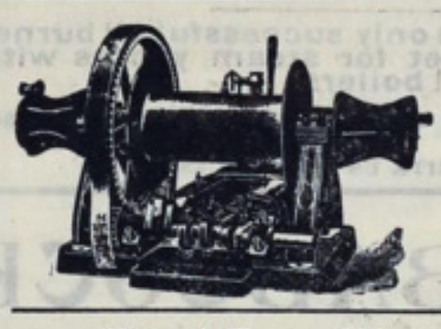

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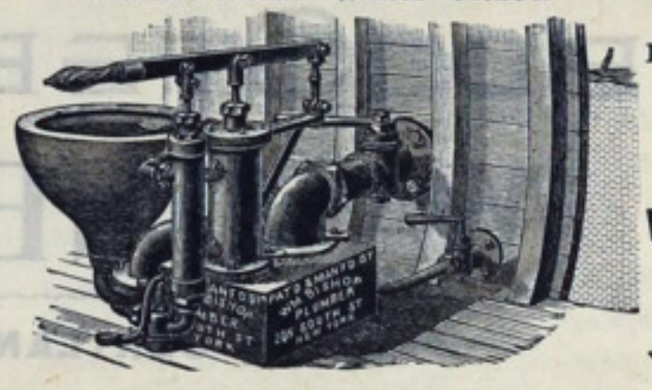

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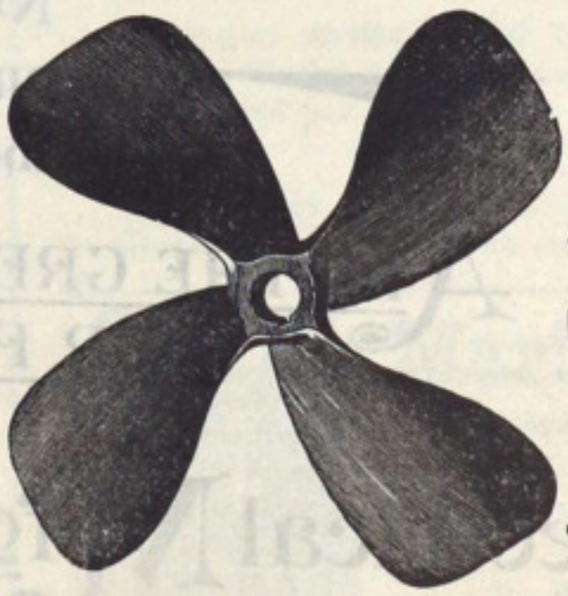

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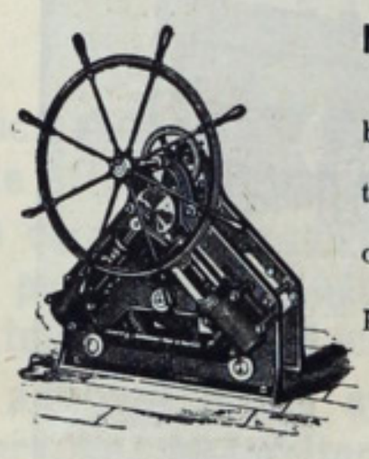

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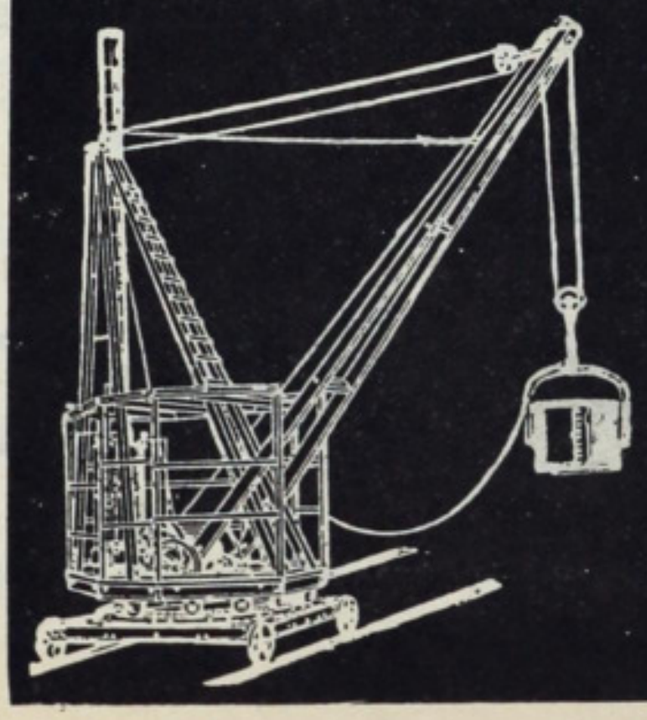

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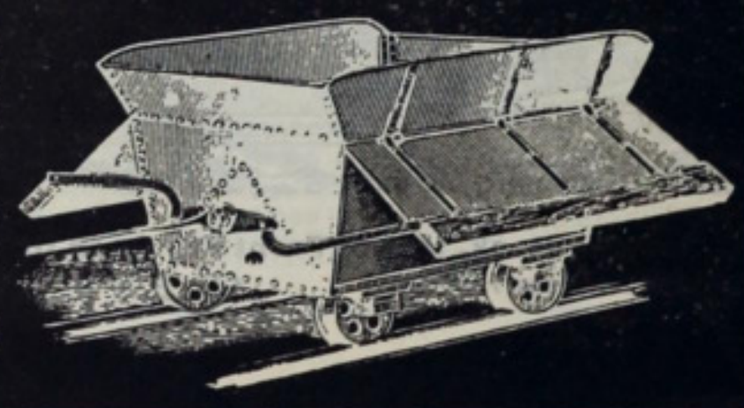

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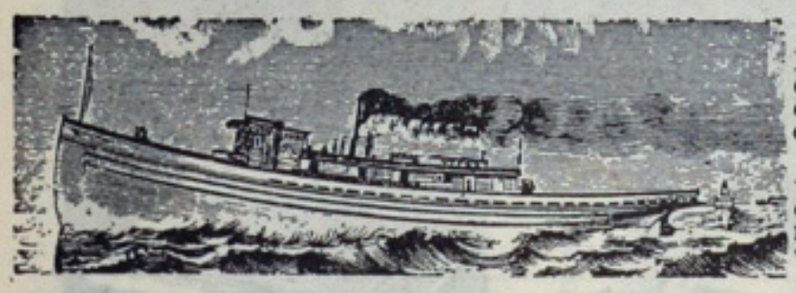

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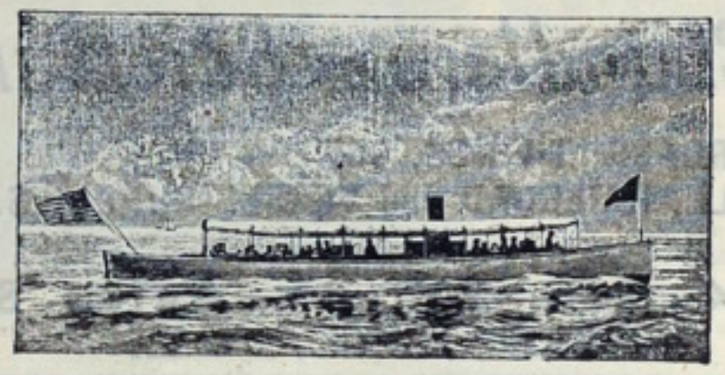

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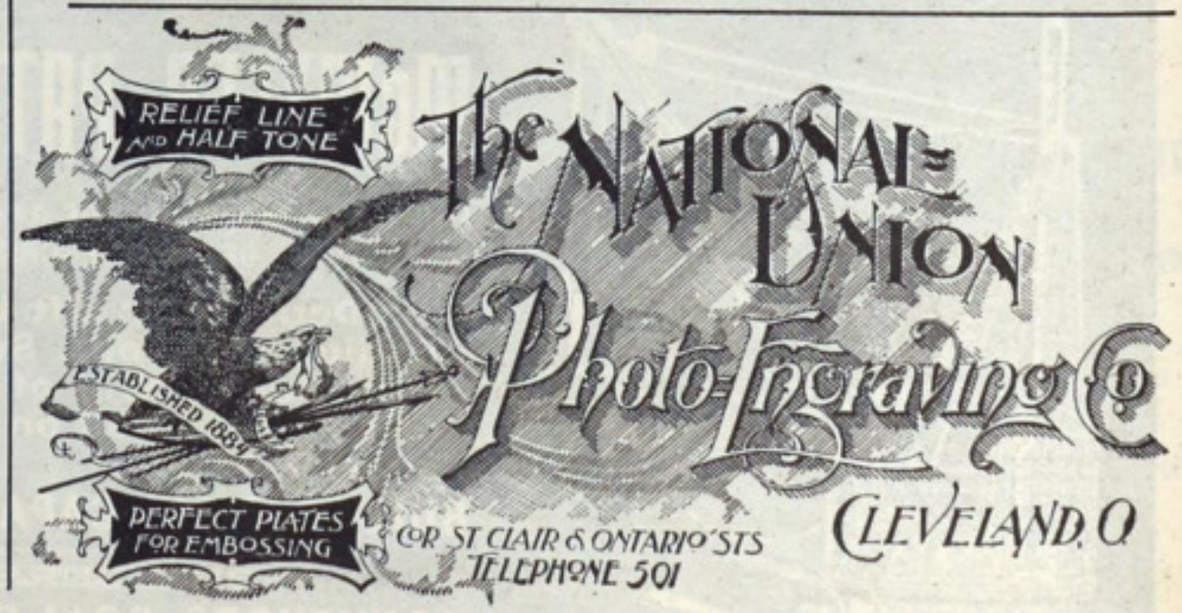

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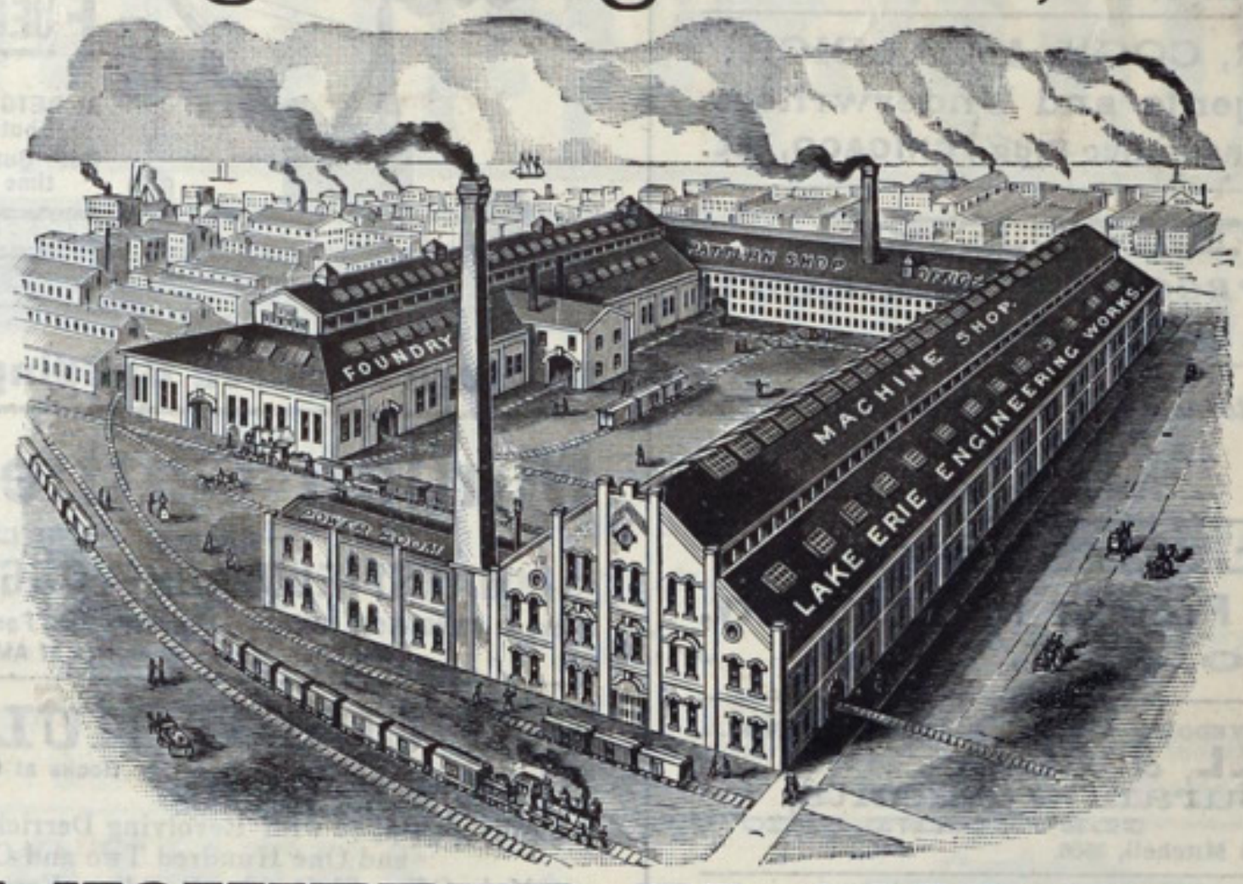

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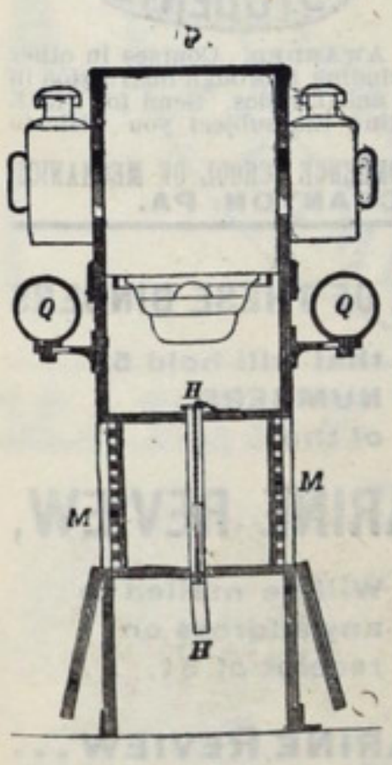

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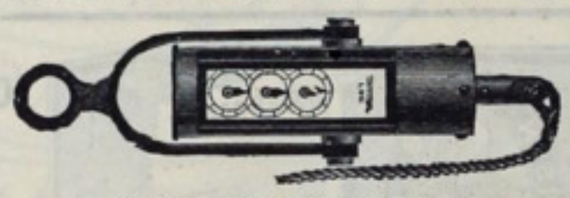

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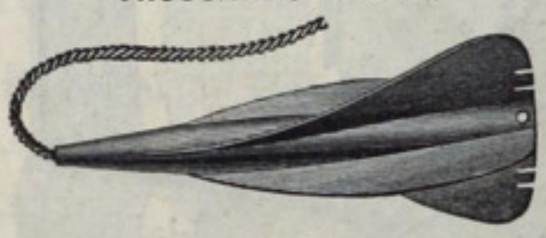

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U. S. ENGINEER OFFICE, 157 Ottawa St., Grand Rapids, Mich. March 5, 1895. Sealed proposals will be received here until 12 o'clock noon, April 4, 1895, and then publicly opened, for Breakwater construction at Petoskey, Mich., and for Pier extensions at Frankfort Harbor, Mich. Specifications furnished on application to G. J. LYDECKER, Lt. Col., Engrs. april 1

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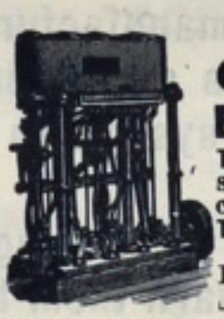
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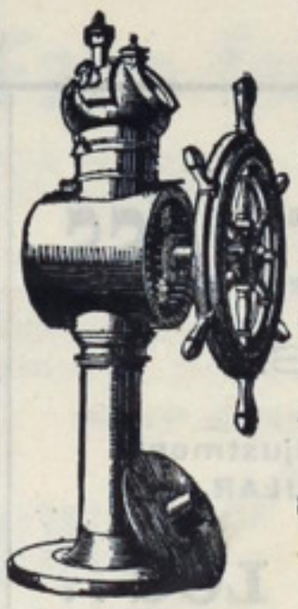
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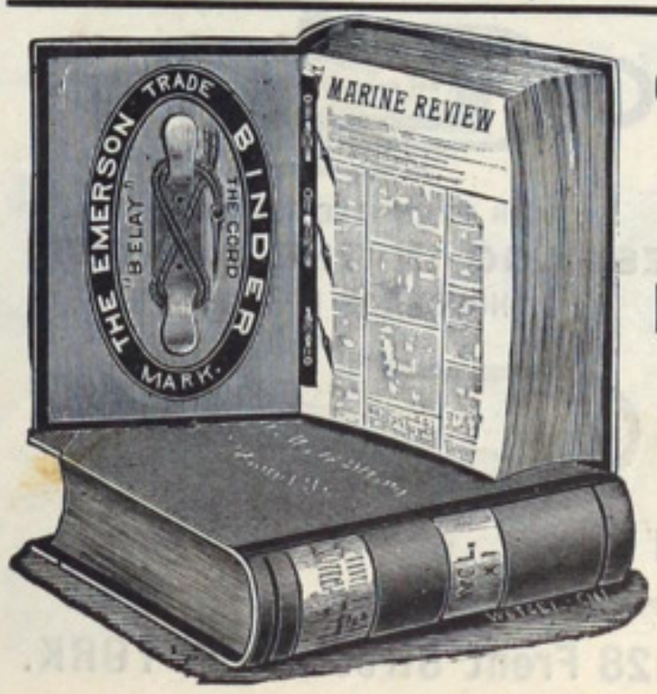

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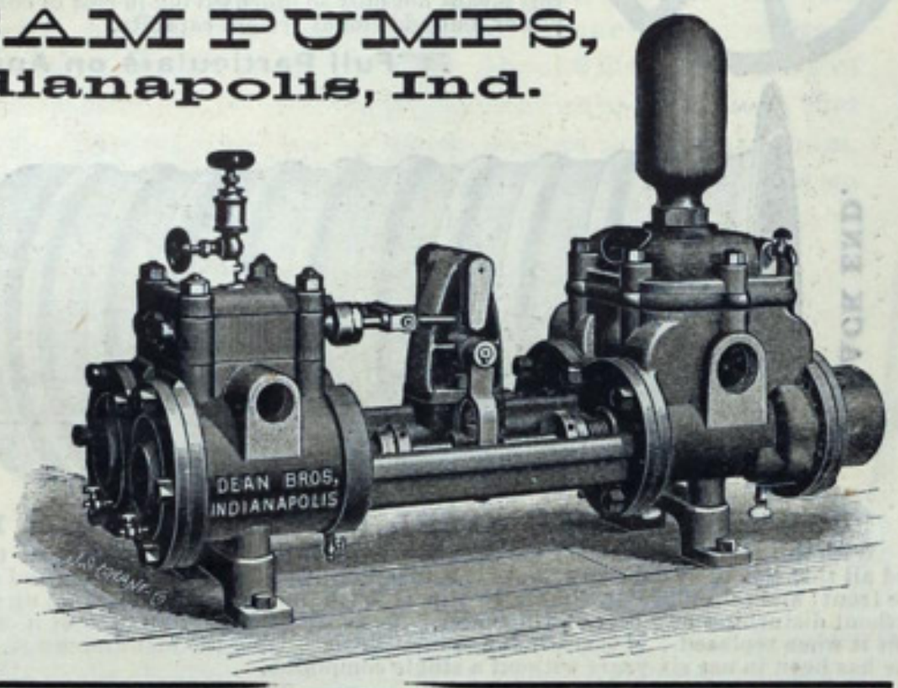

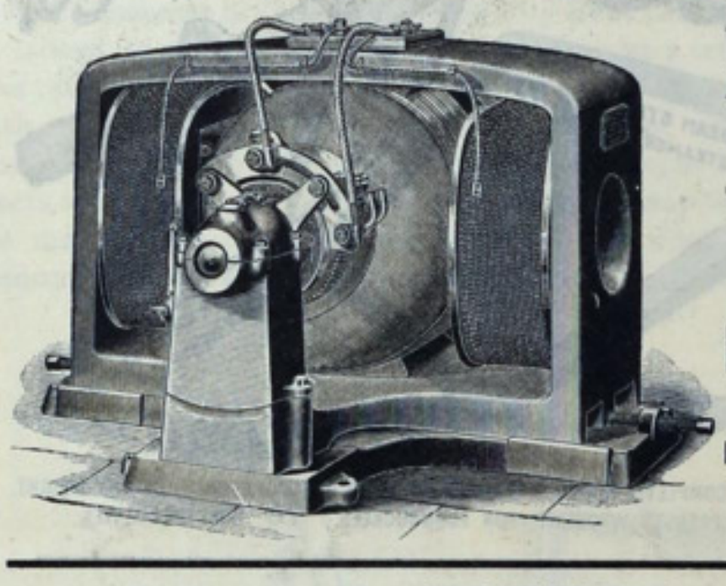

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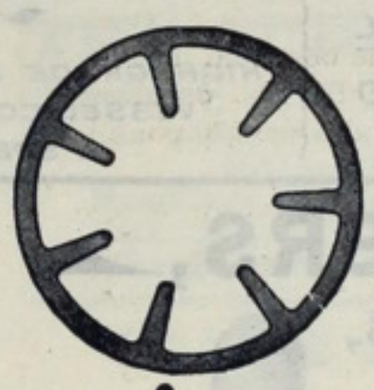

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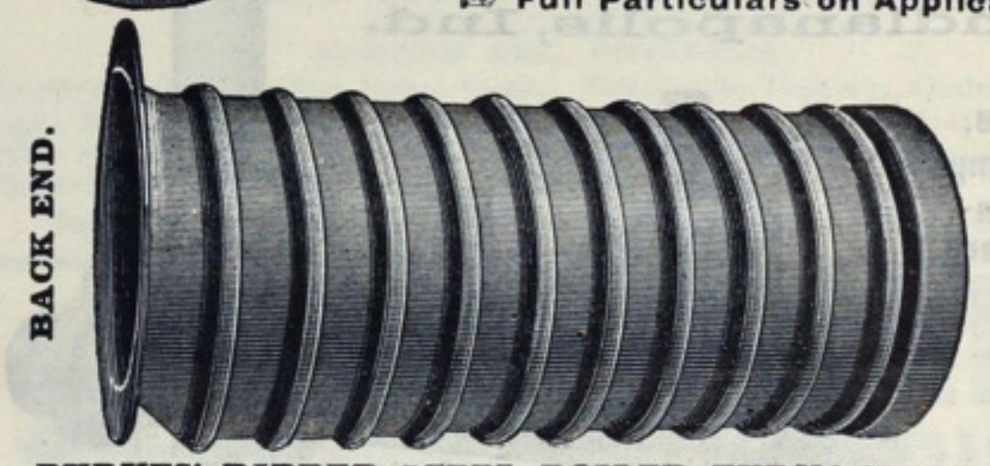

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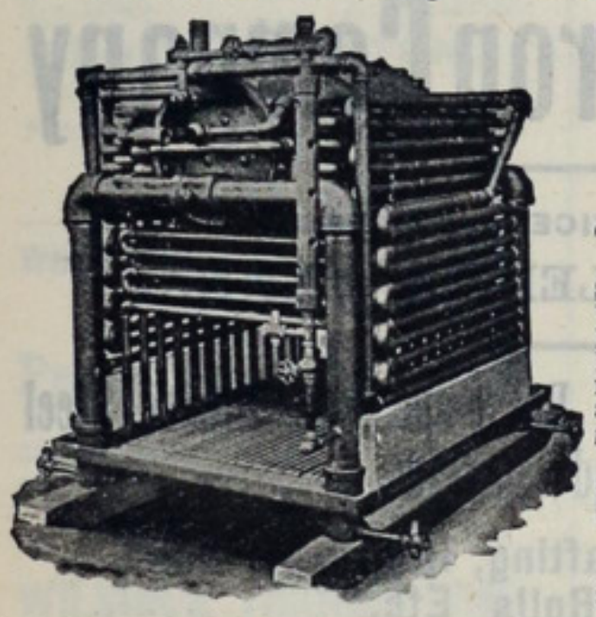

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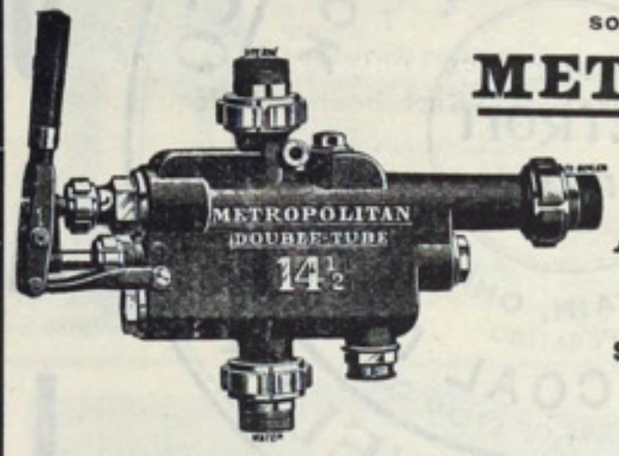

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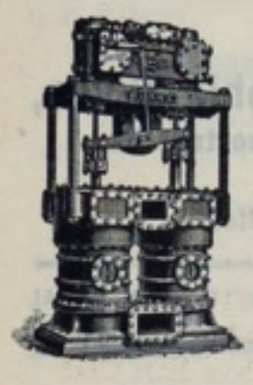

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